Jianjin Xu

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EDUCATION

Columbia University New York, NY
M.S. in Computer Science Aug 2019 – Dec 2020
Tsinghua University Beijing, CN
B.Eng. in Computer Science Aug 2015 – July 2019

- Research interests: GAN, Neural Network Interpretation, Instance Segmentation
- Programming: C/C++, Python, Lua. (Pytorch, Tensorflow, Torch, Caffe)
- Awards and Honors: 2rd Prize for 2017 Mathematical Contest in Modeling 02/2017
  3rd Prize in 36th Challenge Cup Competition of Undergraduate Curricular Academic Science and Technology Works, Tsinghua University 04/2018

RESEARCH EXPERIENCE

Linear Semantics of Generative Adversarial Networks 08/2019 –
Supervised by Prof. Changxi Zheng, Columbia University

- Proposed to decode the internal representation of GANs by linear transformation and showed that linear is sufficient.
- Proved that linear notion of semantics is present in many GAN models trained on diverse dataset.
- Showed that the linearity has close correlation with the synthesis quality of generator and proposed Linear Semantic Score as an indicator for quality of a particular category.
- 1st author paper (in process).

Frame Difference-Based Temporal Loss for Video Stylization 06/2017 – 11/2018
Supervised by Prof. Xiaolin Hu, Tsinghua University

- Proposed a simple loss function to address the temporal stability problem in video stylization (transfer the style of video into an artwork).
- Applied the frame-difference based loss on pixel and feature level to replace existing optic-flow based loss.
- Won over existing methods by large scale user study (4800 votes) on both frame quality and video stability.

Unrestricted Vehicle Re-Identification System with Deep Metric Learning 06/2018 – 09/2018
Internship at MSRA, Supervised by Lead Researcher Xun Guo

- Developed a re-identification system that inputs raw videos of monitors and identified the same vehicle appeared. The system first detects vehicle by faster RCNN, then conducts tracking and matching by learned deep metrics.
- Trained the deep metric model on VeRi dataset, cross validated on VID dataset and applied to real world scene.
- The problem that different vehicles were confused in similar viewpoint was identified and addressed by modified sampling ratio in triplet loss.

Neural Painter: A smart image manipulator based on simple line-drawings 10/2017 – 04/2018
Supervised by Prof. Xiaolin Hu

- Aimed at modifying image through easy user directions, in the form of simple line-drawings.
- Built a system covering dataset preparation, GAN core technology implementation, frontend and backend development as team leader and 1st contributor.
- Won 3rd prize in 36th Tsinghua Challenge Cup and awarded outstanding project in Peking Student Innovation and Entrepreneurship Training Program.

SELECTED PROJECT

Optional Depth Pathway for Mask-RCNN 10/2019 – 01/2020
Supervised by Prof. Shuran Song

- Explored to enhance Mask-RCNN with optional depth module such that it is able to accept both RGB and RGB-D images and have similar performance with networks trained with corresponding data separately.

Interactive Edit in Aesthetic Painting Generation System 07/2018
Supervised by Prof. Jia Jia

- Added an interactive image edit module to original painting generation system (AI painting: An Aesthetic Painting Generation System, ACMMM'18).
- GrabCut (Rother et al. 2004) was used for interactive segmentation, GAN completion network (Iizuka et al. 2017) was used for image inpainting, poisson image edit (Perez et al. 2003) was used for image fusion.

A Large Scale Spiking Neural Network Simulator based on CUDA 05/2016 – 12/2016
Supervised by Prof. Feng Chen

- Developed independently a parallel algorithm by CUDA able to speed up around 20 times than CPU.

EXTRACURRICULAR ACTIVITIES

- Chairman of Tsinghua Future Internet and Computation Club (Microsoft Student Club) 06/2018 – Present
- Volunteer of Computing in the 21st Century Conference and Asia Faculty Summit 2018 11/2018